ACCEPTANCE TEST REPORT

FOR THE

MODIS STE SOFTWARE

1. INTRODUCTION

1.1. Identification of Document

This document, the Acceptance Test Report for the MODIS Ground Support Equipment (GSE) System Test Equipment (STE), is part of CDRL 217 written in accordance with NASA-DID-R009.

1.2. Scope of Document

This document is applicable to the following components of the STE software for MODIS:

Payload Interface Controller Real-Time

Payload Interface Controller Host

Archiver

Stimulus Controller

System Test Controller

Software Development & Configuration

COTS Software

1.3. Purpose and Objectives of Document

The purpose of this document is to document the outcome of the acceptance tests performed on the MODIS GSE STE software.

1.4. Document Status and Schedule

This document is issued at the conclusion of each performance of the acceptance test procedure. The version(s) of software and test procedures utilized for this acceptance test are documented in Section 3.

1.5. Document Organization

Listed below are brief descriptions of the contents of each major section of this document.

Section 1, INTRODUCTION, provides the overview of the document

Section 2, RELATED DOCUMENTATION references the documentation that is required for a complete understanding of the contents of this plan.

Section 3, REPORTS, identifies the tests and their objectives, including traceability to STE requirement specifications.

Section 4 includes ABBREVIATIONS and ACRONYMS.

Section 5, GLOSSARY, is a pointer to program glossary.

Section 6, NOTES is not applicable.

Section 7, APPENDICES, contains test report details.

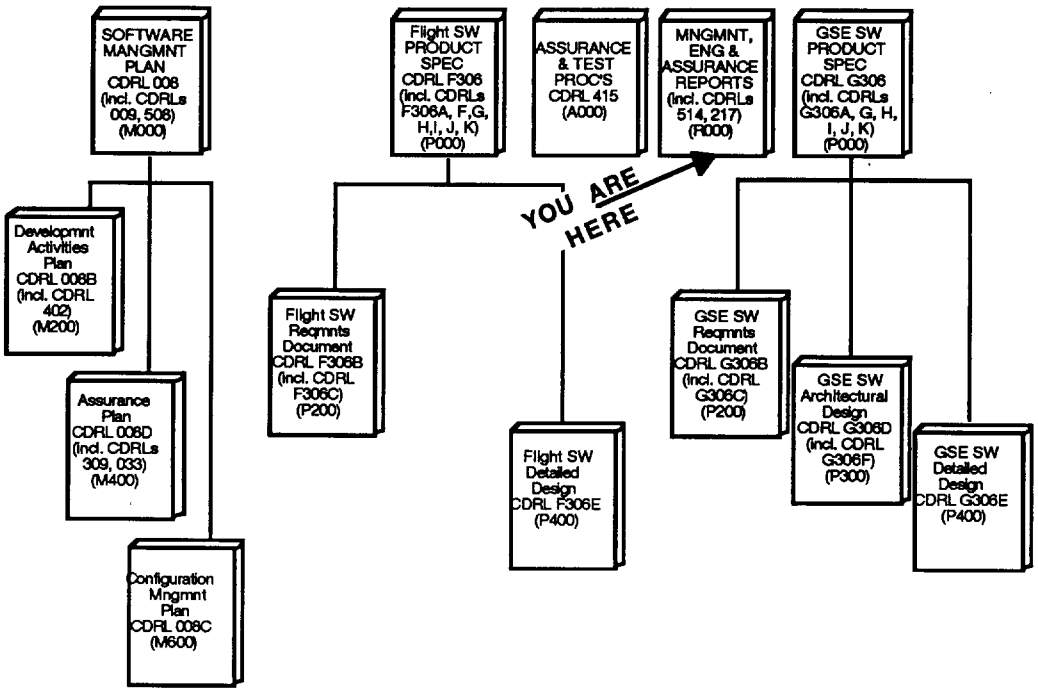

Figure 1-2 MODIS Software Documentation Tree

2. RELATED DOCUMENTATION

2.1. Parent Documents

The following document is parent to this document: CDRL 008A, Software Management Plan of the MODIS Flight and GSE Software Systems.

2.2. Applicable Documents

NASA-DID-R009

NASA Document 422-20-04, EOS MODIS Software Management Requirements, Version 1.4

MODIS Software Assurance Plan and Specification, CDRL 309

SBRC 152460, CDRL G306H-5, STE Payload Interface Controller Real-Time VDD

SBRC 152919, CDRL G306H-4, STE Payload Interface Controller Host VDD

SBRC 153753, CDRL G306H-3, STE Archiver VDD

SBRC 153754, CDRL G306H-6, STE Stimulus Controller VDD

SBRC 153752, CDRL G306H-1, STE System Test Controller VDD

SBRC 153542, CDRL G306H-7, STE Software Development & Configuration VDD

SBRC 153543, CDRL G306H-8, STE COTS Software VDD

SBRC 152897, CDRL G415A, MODIS STE Software Acceptance Test Procedure

2.3. Information Documents

The following documents, although not directly applicable, amplify or clarify the information presented in this document, and are not binding:

Program/Project Instruction 1.1 MODIS Glossary and List of Acronyms

MODIS STE Software Product Specifications, CDRL G306

OASIS CSTOL Reference Manual

3. REPORTS

3.1. Test Set Identification

These tests were performed on MODIS STE1, Top Assembly Number 217290.

3.2. Test Procedure Identification

SBRC 152897 Rev A, CDRL G415A

3.3. Software Identification

MODIS STE Software System, consisting of the following components:

SBRC 152460 Rev -, CDRL G306H-5, STE Payload Interface Controller Real-Time VDD

SBRC 152919 Rev -, CDRL G306H-4, STE Payload Interface Controller Host VDD

SBRC 153753 Rev -, CDRL G306H-3, STE Archiver VDD

SBRC 153754 Rev -, CDRL G306H-6, STE Stimulus Controller VDD

SBRC 153752 Rev -, CDRL G306H-1, STE System Test Controller VDD

SBRC 153542 Rev -, CDRL G306H-7, STE Software Development & Configuration VDD

SBRC 153543 Rev -, CDRL G306H-8, STE COTS Software VDD

3.4. Test Date(s)

Testing of the MODIS STE software system was accomplished between 24 January 1996 and 12 February 1996.

Detailed accounts of the testing are contained in appendices 7.1 through 7.4.

4. ABBREVIATIONS AND ACRONYMS

ARC	Archiver
DID	Data Item Description
GSE	Ground Support Equipment
MODIS	Moderate Resolution Imaging Spectroradiometer
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
PIC	Payload Interface Controller
SIC	Stimulus Controller
STC	System Test Controller
STE	System Test Equipment
SWATP	Software Acceptance Test Procedure
TAC	Test Analysis Controller
VDD	Version Description Document

Please refer to the SBRC MODIS Program/Project Instruction 1.1 MODIS Glossary and List of Acronyms for additional information.

5. GLOSSARY

Please refer to the SBRC MODIS Program/Project Instruction 1.1 MODIS Glossary and List of Acronyms.

6. NOTES

This section is not applicable since no notes are applicable at this time.

7. APPENDICES

7.1. Archiver Test Report

The first performance of the Archiver (ARC) portion of the MODIS STE Software System began on 02 February 1996 and was completed on 05 January 1996. The ARC portion as run is composed of 3 sub-tests, as follows:

- AT-ARC-001 ARC Data Collection & Archive
- AT-ARC-002 ARC Data Accessibility & File Transfer
- AT-ARC-003 ARC Database Retrieval

Redlines were made to several of the sub-tests during the dry run and the formal execution of the procedure. These redlines were incorporated and the procedures were run "as redlined". These redlines are identified in SECR Number MS053/01.

The following subtests fail to verify all of the requirements allocated to the subtest. SDRs have been written to record the anomalies:

- AT-ARC-001

See SDR Numbers: MODIS SDR-020, 021, 022 and 023.

The following requirements for test case AT-ARC-001 are ambiguous and therefore untestable. They are not adequately addressed by the test procedure in the opinion of the tester.

Collect Telemetry

ARC-SRS-024

Collect Event Data

ARC-SRS-032

ARC-SRS-033

The following requirements for test case AT-ARC-001 are not adequately addressed by the test procedure in the opinion of the tester.

Collect Telemetry

ARC-SRS-067

ARC-SRS-068

ARC-SRS-069

ARC-SRS-025

ARC-SRS-071

Assemble Acquisition Data

ARC-SRS-030

ARC-SRS-031

Collect Event Data

ARC-SRS-037

Search for Event

ARC-SRS-043

The issues stated above regarding inadequate testing and untestable requirements are addressed in SECRs MS053/02 and MS053/03 against the ATP. Corresponding changes will be needed in the SRS to fully address these problems.

Test Facilitator: Daniel Greene

QA witness: Robert Burns

7.2. Payload Interface Controller Test Report

The first performance of the Payload Interface Controller (PIC) portion of the MODIS STE Software System Acceptance Testing began on 26 January 1996 and was completed on 31 January 1996. The participants were Joan Kuehn, test conductor, and Bob Burns, Software Quality Assurance. Additional support was provided by Gary Gensler (AT-PICSW-007 and AT-PICSW-009), Chris Laufer (AT-PICSW-007 and AT-PICSW-008), and Dan Greene (AT-PICSW-008).

The PIC portion is composed of 15 separate tests. AT-PICSW-010 cites Program Memo PL3095-T00731 to verify requirement PIC-SSS-094 for system test operating language, telemetry monitoring and display. The other requirements are allocated to the 14 executable test identified below:

- AT-PICSW-001 Memory Load Command Test
- AT-PICSW-002 Serial Housekeeping Receive Test
- AT-PICSW-003 Serial Bus Major Cycle Test
- AT-PICSW-004 Memory Dump Command Test
- AT-PICSW-005 MODIS Serial Command Test
- AT-PICSW-006 Serial Bus Traffic Simulation Test
- AT-PICSW-007 Power Supply Command and Telemetry Test
- AT-PICSW-008 EOS Common Command Test
- AT-PICSW-009 Environmental Monitor Test
- AT-PICSW-012 MODIS Mode Test
- AT-PICSW-014 FDDI Test Pattern Generator Test
- AT-PICSW-015 FDDI Science Data Receiver Test
- AT-PICSW-016 Science Data Display Test
- AT-PICSW-017 Telemetry Test - Display and Monitor

Redlines were made to several of the PIC tests during the dry run and the formal execution of the procedure. These redlines were incorporated and the procedures were run "as redlined". These redlines are identified in SECR Number MS045/02.

The Centronics printer is an impact printer which was not available in the Clean Room. Therefore, the PIC tests were run without a Centronics printer to capture the 1553B Bus Analyzer trap data. A laser printer was used to make screen prints from a number of tests, as follows:

1. In AT-PICSW-002, a screen print was made of the both the initial state and final state of each of the MODIS Telemetry Panels.

2. In AT-PICSW-008, a print was made of the following oscilloscope readings:

   - A relay command sent to the Remote Telemetry Interface Unit (4.4.8.3.2).
   - A "Time Mark" pulse pattern (4.4.8.3.3).

3. In AT-PICSW-012, the following screen prints were made:

   - The MODIS Control Processor Telemetry Data Display and the CSTOL message window showing that the message files were being switched (4.4.12.3.9).
   - The contents of the event log (4.4.12.3.12).
   - The contents of the ontime file (4.4.12.3.13).

4. In AT-PICSW-015, a number of prints were made to show the contents of the test.ascii file which contains the data acquired from the Test Pattern Generator (4.4.15.3.3).

5. In AT-PICSW-016, a number of prints were made to show the contents of MODIS Science Data Fast Display (4.4.16.3).

6. In AT-PICSW-017, screen prints were made of the MODIS Telemetry Panels throughout the test (4.4.17.7).

Several of the tests failed to verify all of the requirements allocated to them. The following SDRs have been written to record the anomalies:

SDR Number	Test Identification	Possible Cause/Comments
• MODIS-SDR-014	AT-PICSW-002	The discrepancies appear to be the results of changes made in the E151840 Tables (20-2, 20-4, 20-5, 20-6). Additional changes to the telemetry tables and/or a modification to the test procedure are necessary to resolve the SDR.

• MODIS-SDR-015	AT-PICSW-003	Errors in the timing messages due to an unknown software error. Probable software change to resolve the SDR.
• MODIS-SDR-016	AT-PICSW-004	OASIS software error in establishing and recording to the MOD_DUMP_BRIDGE file.
• MODIS-SDR-017	AT-PICSW-005	Unanticipated error message received when raw command sent and unexpected values in the message format of several serial commands. Probable software change and test procedure modification required to resolve the SDR.
• MODIS-SDR-019	AT-PICSW-017	The discrepancies appear to be the results of changes made in the E151840 Tables (20-2, 20-4, 20-5, 20-6). Additional changes to the telemetry tables, a modification to the test procedure, and/or modification to the display software are necessary to resolve the SDR.

Voltage and current settings could not be applied to the MODIS Power Supply Settings portion of the MODIS Power Control & Status Window. This anomaly is captured in SDR Number MODIS-SDR-018. By using the following commands at the CSTOL prompt (as a work around), the requirements have been verified:

- Test Step 4.4.7.3.j set pic_ps voltage to 120.0v
- Test Step 4.4.7.3.k. set pic_ps voltage to 130.0v
- Test Step 4.4.7.3.l. set pic_ps voltage to 132.0v
- Test Step 4.4.7.3.p set pic_ps current to 2.9a
- Test Step 4.4.7.3.t. set pic_ps voltage to 120.0v

7.3. Stimulus Controller Test Report

The first performance of the Stimulus Interface Controller (SIC) portion of the MODIS STE Software System Acceptance Testing began on 7 February 1996 and was completed on 12 February 1996. The participants were John Leonard, test conductor, and Bob Burns, Software Quality Assurance.

The SIC portion is composed of 7 separate tests.

- AT-SIC-001 IAC Monitor and Control
- AT-SIC-002 STC Control of IAC
- AT-SIC-003 SPMA Monitor and Control
- AT-SIC-004 STC Control of SPMA
- AT-SIC-005 Command File Test
- AT-SIC-006 STOL
- AT-SIC-007 Input Commands Format Test

Redlines were made prior to or during the formal execution of six of the SIC tests. The tests redlined are AT-SIC-001, AT-SIC-002, AT-SIC-003, AT-SIC-004, AT-SIC-005, and AT-SIC-006. These redlines were entered into the data master and the procedures were run "as redlined". These redlines are identified in SECR Number MS057/01.

No failures occurred during testing. All tests passed.

7.4. System Test Controller Test Report

The first performance of the System Test Controller (STC) portion of the MODIS STE Software System Acceptance Testing began on 24 January 1996 and was completed on 25 January 1996. The participants were Alyce Jackson, test conductor, and Bob Burns, Software Quality Assurance.

The STC portion is composed of 6 separate tests. Tests not shown in the following list (2,3,7,8) have been deleted.

- AT-STC-001 Command Format Test
- AT-STC-004 Command File Test
- AT-STC-005 Display Reconfiguration Test
- AT-STC-006 External Status Display & Warning Test
- AT-STC-009 Event Log Archive Preparation Test
- AT-STC-010 Display Command Test

Redlines were made to two of the STC tests during the formal execution of the procedure. The tests redlined are AT-STC-001 and AT-STC-004. These redlines were entered into the data master and the procedures were run "as redlined". These redlines are identified in SECR Number MS054/01.

Failures occurred in two of the tests, AT-STC-010 and AT-STC-006. These failures are documented in MODIS SDR-012 and MODIS SDR-013 respectively. Briefly, the failures were due to the SIC software being in an incomplete state. When the SIC software has been corrected, the test steps that failed should be repeated.